REMARKS/ARGUMENTS

Claims 57-131 had been withdrawn as a result of an earlier restriction requirement. Claims 15, 16, 25-26 and 55 had been previously cancelled without prejudice or disclaimer. Claims 6, 22, 24, 27, 42, 43, 46, 47, 49, 50, and 54 are cancelled without prejudice or disclaimer.

Claims 1-5, 7-14, 17-21, 23-24, 28-41, 44-45, 48, 51-53, 56, and 132-138 remain in this application.

Claims 1, 7-9, 30, 31, 34, 44, 51, and 132 are currently amended. Support for the claim amendments can be found in the Application as originally filed, such as at page 16 lines 17-23, page 17 lines 5-8, and page 17 lines 30-32 (e.g. Claims 1, 30, 31, 34, 51, and 132). The dependency of Claim 44 has been amended.

1. Claim Objections

The Patent Office has objected to Claims 6-9 under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. The Patent Office asserts that Claim 6 requires the pressure staying constant through both reacting times, which means that the vessel stays substantially constantly filled, and that Claim 1 requires that the vessel be partially evacuated and refilled, wherein the Patent Office concludes that thus it has to be made at least partially empty. The Patent Office asserts that Claim 6 changes the scope from one which the vessel is emptied (at least partially) to one that is never empty. The Patent Office concludes that these are mutually exclusive scopes and that Claim 6 does not limit Claim 1 but instead takes it to a completely new scope. The Patent Office did not further treat Claims 6-9 on their merits.

The Patent Office states that Applicants have argued that other gases could be used to maintain total pressure in the vessel and the Patent Office asserts that this is not understood. The Patent Office states that Claim 1 requires evacuating – if the pressure is maintained, then the vessel is not evacuated.

The Patent Office also states that Applicants have argued that Ikuta does not teach or suggest holding the preform in a doping atmosphere which is kept at a pressure higher than ambient. The Patent Office disagrees and points to col. 11, line 18 as clearly teaching pressures greater than ambient.

The Patent Office further states that Applicants have argued that col. 13, lines 25-37, teaches away from the invention at col. 13, lines 25-37, but the Patent Office disagrees and asserts that passage only exemplifies an "example", and that the present rejection is not limited to the col. 13 embodiment.

Applicants submit that the objection has been obviated by cancellation of Claim 6. Applicants respectfully request consideration of Claims 7-9 as amended with full treatment on their merits.

2. Claim Rejections under 35 U.S.C. §103

The Patent Office has rejected Claims 1-5, 10-14, 17-24, 27-54, 56 and 132-138 under 35 U.S.C. 103(a) as being unpatentable over Ikuta 6499317. The Patent Office refers to the prior Office Action for the manner in which Ikuta is applied, which included: pointing to Col. 13, lines 25-37 for disclosing pulsed doping substantially as claimed; asserting that Ikuta does not explicitly say that there is evacuating step as claimed, but Col. 13, line 23 substantially supplies this lack by saying that the process can have more fluorine doping; stating that there is no indication as to how do the "more" doping, but asserting that it would have been obvious to do more doping by repeating the same "fluorine doping" described at Col 13, lines 25-37, and that performing the Ikuta fluorine doping twice would result in the two pulsings of SiF_4, namely providing the pulse/atmosphere, holding at the normal pressure for a predetermined time to dope, reducing the pressure (i.e. evacuating) to 1 Torr again, refilling with SiF_4, and holding again.

As to the new pressure limitations, the Patent Office points to col. 11, line 18.

As to the new limitation that no more than 0.5 splm flows out of the vessel, the Patent Office concludes that one would immediately infer that the pressure vessel can and will maintain the pressure, citing: MPEP 2144.01; In re Fritch, 972 F.2d 1260, 1264-65, 23 USPQ2d 1780, 1782-83 (Fed. Cir. 1992); In re Sovish, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985).

The Patent Office alternatively concludes that, if any gas leaked out, it would have been obvious to seal the leak so as to not waste any gas.

As to claims 10 and 52-54, the Patent Office concludes that it would have been obvious to replenish any consumed specie – referring to col. 11, lines 15-16 for a teaching of a specific concentration – further concluding that the only way one can obtain this is to replace any consumed.

The Patent Office alternatively concludes that, since the pressure would drop when fluorine is consumed, it would have been obvious to add more gas, so as to maintain the pressure constant.

In view of the claims as amended above, the rejection is traversed.

First, Applicants note that the present invention employs an atmosphere with greater than ambient pressure (pressurized to a gage pressure of at least 0.1 atm gage) and high temperature (between 1100 and 1300 °C) to dope an optical waveguide preform with fluorine. An optical waveguide preform is used to make an optical waveguide, or fiber. See present Specification, page 1 line 11, page 6 lines 7-9.

Applicants submit that Ikuta is directed to glass used for optical components, but not optical waveguides or optical fibers. See col. 1 lines 7-22:

> The present invention relates to a synthetic quartz glass to be used for optical components for an apparatus employing ultraviolet lights having

wavelengths of at most 400 nm as a light source, and a process for producing it. More specifically, the present invention relates to a synthetic quartz glass to be used as optical components (including products and semifinished products) such as a lens (projection type or illumination type), a prism, an etalon, a photomask, a pericle (pericle material, pericle flame or both) and a material for windows, to be used for light within a range of from the ultraviolet region to the vacuum ultraviolet region emitted from a light source such as an excimer laser (XeC1:308 nm, KrF:248 nm, Arf:193 nm), a F_2 laser (157 nm), a low pressure mercury lamp (185 nm), a Xe_2 * excimer lamp (172 nm) or a deuterium lamp (110-400 nm); and a process for producing it. (Emphasis added)

Indeed, "waveguide" or "fiber" or "optical fiber" does not appear anywhere in Ikuta. Applicants submit that Ikuta is not in the field of optical waveguide preform manufacture. According to the Federal Circuit, "[t]he analogous-art test requires that ... a reference is either in the field of the applicant's endeavor or is reasonably pertinent to the problem with which the inventor was concerned in order to rely on that reference as a basis for rejection." In re Kahn, 78 USPQ2d 1329, 1336 (CA FC 2006), citing In re Oetiker, 977 F.2d 1443, 1447 [24 USPQ2d 1443] (Fed. Cir. 1992). Applicants further submit that Ikuta is not pertinent to doping optical waveguide preforms. Accordingly, Applicants submit that Ikuta constitutes non-analogous art and should not form the basis of the rejection under 35 U.S.C. §103.

Applicants submit that Ikuta teaches that such glass to be used for optical components must have durability to ultraviolet light. Col. 1 line 55 to col. 2 line 5. Ikuta indicates that conventional synthetic quartz glass is subject to forming an absorption band when irradiated with ultraviolet light for a long period of time. Col. 2 lines 6-16. Ikuta states that one cause of such absorption band formation is a structural defect of the synthetic quartz glass, i.e. an oxygen deficient defect such as ≡Si-Si≡ and ≡Si-H, or an oxidation type defect such as ≡Si-O-O-Si≡. Col. 2 lines 17-30.

Applicants submit that Ikuta discloses either (a) fluorine doping, or (b) hydrogen doping.

Applicants submit that Ikuta teaches that, when doping with fluorine, low temperatures (< 600 °C) should be used in order to prevent defects that can cause an absorption band formation (Col. 10 lines 32-52):

> If the temperature at the time of holding the porous quartz glass body in an atmosphere containing a fluorine compound is high, the ≡Si-- Si≡ defect is likely to be formed. Namely, if the porous quartz glass body is treated in an atmosphere containing a fluorine compound at a high temperature, the activity of the fluorine compound tends to be high, and the ≡Si--Si≡ detect tends to be formed as shown in the following formulae (8) and (9):
>
> ≡Si--O--Si≡→≡Si--Si≡ (8)
>
> fluorine compound
>
> ≡Si--OH→≡Si--F (9)
>
> fluorine compound
>
> Accordingly, when the porous quartz glass body is treated in an atmosphere containing a fluorine compound at a low temperature of at most 600

°C., the activity of the fluorine compound can be suppressed, and the reaction of the above-mentioned formula (9) alone will take place without the reaction of the formula (8), and accordingly the ≡Si--Si≡ defect may not be formed.

Furthermore, Applicants submit that Ikuta teaches fluorine doping either (a) at higher pressures (i.e., the range 0.1 to 10 atm) but only in conjunction with a low temperature of at most 600 °C (col. 11 lines 16-18), or (b) at higher temperatures (i.e., at most 1200 °C) but only in conjunction with a reduced pressure (at most 100 Torr) (col. 11 lines 26-34). It should be noted that Ikuta states that "atm" and "Torr" represent absolute pressures, not gauge pressures. Col. 11 lines 23-25.

Indeed, the two examples in Ikuta that reported fluorine doping at temperatures greater than 600 °C (i.e. Examples 4 and 5, col. 17 lines 25-50 and Table 1, reporting doping temperatures of 700 and 1200 °C, respectively) also utilized a reduced pressure of only 10 Torr (absolute), yet these two examples were reported to have oxygen deficient defects (col. 4 line 63 to col. 5 line 4; col. 14 lines 26-37; Table 1: Evaluation 5: 245 nm absorption coefficient: exceeds $2x10^{-3}$; Evaluation 6: 163 nm absorption: Present).

That is, Examples 4 and 5 of Ikuta reporting fluorine doping with temperatures greater than 600 °C which resulted in UV defects (even though at very low pressures of 10 Torr). Examples 4 and 5 also had the largest amounts of fluorine in the glass (Table 1: 2210 and 10412 ppm, respectively) relative to the other examples.

In contrast, the presently claimed invention comprises pressure of at least 0.1 atm gage *in conjunction with* temperature between 1100 and 1300 °C to dope an optical waveguide preform with fluorine. Higher pressure and higher temperature result in higher fluorine doping (as compared to lower temperatures and/or lower pressures).

With regard to the assertion of the Patent Office that it would have been obvious to do more doping by repeating the same "fluorine doping" described at Col 13, lines 25-37, Applicants respectfully submit that Ikuta does not teach or even suggest repeating the same "fluorine doping" described at Col 13, lines 25-37, nor has the Patent Office indicated any motivation to repeat the same "fluorine doping". According to the Federal Circuit, "[w]hen obviousness is based on a particular prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference." See B.F. Goodrich Co. v. Aircraft Braking Systems Corp., 37 USPQ2d 1314, 1318 (Fed. Cir. 1996). Applicants submit that the Patent Office is applying impermissible hindsight in order to arrive at the present invention.

With regard to the assertion of the Patent Office concerning Claims 10 and 52-54 that it would have been obvious to replenish any consumed specie and referring to col. 11, lines 15-16 of Ikuta for a teaching of a specific concentration, Applicants submit that Ikuta merely states that its fluorine doping atmosphere can include a fluorine-containing gas within a concentration range, per col. 11 lines 12-16:

> "As the fluorine- containing atmosphere, preferred is an inert gas atmosphere containing a fluorine-containing gas (such as SiF_4 , SF_6, CHF_3 , CF_4 or F_2) in an amount of from 0.1 to 100 vol %, particularly from 1 to 20 vol %.

Applicants respectfully submit that col. 11, lines 15-16 does not teach or suggest replacing any consumed species. Conversely, Ikuta does disclose introducing fluorine-containing gas into a pressure vessel and then terminating such inlet flow, after which the preform is left in the pressure vessel to be doped with fluorine, such as described at col. 13 lines 25-37 and in Examples 1-8, which does not teach or suggest replenishing any consumed specie.

In view of the above and the foregoing, Applicants submit that the presently claimed invention is patentable over Ikuta 6499317. Accordingly, Applicants respectfully request withdrawal of the rejection.

3. Conclusion

Based upon the above amendments, remarks, and papers of records, Applicants believe the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Applicants believe that no extension of time is necessary to make this Reply timely. Should Applicants be in error, Applicants respectfully request that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorize the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Joseph M. Homa at 607-974-9061.

Respectfully submitted,

DATE: 12 JULY 2006

Joseph M. Homa
Attorney for Assignee
Registration Number: 40,023
Corning Incorporated
SP-TI-03-1
Corning, NY 14831
Phone: 607-974-9061